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RBS 1032: A dwarf-nucleated spheroidal galaxy with an intermediate-mass black hole hosted in a globular cluster

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Abstract

We report here the multiwavelength observations of the bright supersoft X-ray source, RBS 1032. Most likely, its optical counterpart is a non-emission-line dwarf galaxy with a prominent nucleus. Line and band indices of this nucleus, clearly suggest that its optical spectrum is dominated by the nuclear supermassive globular clusters. No radio and infrared (IRAS) emissions are detected from this dwarf galaxy. Weak near-infrared (2MASS) emissions have been detected. The optical-to-near-infrared colours are consistent with the globular clusters than those of active galactic nuclei. We have shown here that RBS 1032 is not a foreground object. However, with the available data the possibility of RBS 1032 being a classical nova cannot be completely ruled out. We have demonstrated that RBS 1032 is not a X-ray-bright optically normal galaxy. In contrast, we have illustrated that the super-soft X-ray emissions of RBS 1032 may be from a binary system, consisting of an intermediate-mass (~5 × 104 M⊙) black hole with a white dwarf companion. Most likely this system is hosted by one of the nuclear globular clusters of the dwarf galaxy. © 2006 RAS.

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Keywords

Accretion, accretion discs, Black hole physics, Galaxies: dwarf, X-rays: galaxies, X-rays: individual: RBS 1032